

surface of said substrate such that at least a portion of said low-density film is removed without impairing said high-density film beyond a tolerance.

Mehta is from the same patent family as JP 8-319,200 A, which is described in the specification at page 5, lines 18-22; page 6, line 15, through page 8, line 14; page 21, lines 8-11; and page 22, line 23, through page 23, line 6. Mehta disclose a process for selectively removing a porous silicon oxide layer from a substrate having a portion thereon with an exposed dense silicon oxide to be retained on the substrate, the porous silicon oxide layer containing absorbed moisture therein, the process comprising introducing the substrate to a flowing anhydrous gaseous environment consisting of anhydrous inert gas, adding anhydrous hydrogen fluoride gas to the gaseous environment for a pulse time which is at most only shortly longer than that required to initiate etching of the dense silicon oxide, flushing the gaseous environment with anhydrous inert gas for a time sufficient to remove the hydrogen fluoride and water vapor generated by the etching of the porous oxide, and repeating the adding and flushing steps until the porous oxide layer has been removed (abstract). Thus, in Mehta, the anhydrous hydrogen fluoride gas does not flow continuously, as required by the present invention, but in pulses. As an example, Mehta discloses the use of 2 to 9 pulses between about 3 and 8 seconds each, preceded and interspersed by flush cycles of up to 60 seconds each (column 4, lines 39-42). There is no disclosure or suggestion in Mehta to flow the anhydrous hydrogen fluoride gas therein continuously.

Recognizing that Mehta does not disclose or suggest continuous application of the presently-recited mixed gas, the Examiner relies on both Verhaverbeke et al and statements in the specification herein.

With regard to any statements in the specification herein relied on by the Examiner, it is improper. The disclosure in the specification at page 45, lines 1-20 is **Applicants'**

discovery, not that of the prior art. Compare *In re Ruff*, 118 USPQ 340, 347 (CCPA 1958) (copy enclosed) ("To rely on an equivalence *known only to the applicant* to establish obviousness is to assume that his disclosure is a part of the prior art. The mere statement of this proposition reveals its fallaciousness.")

Verhaverbeke et al is drawn to the etching of SiO<sub>2</sub> layers by HF vapor etching. Verhaverbeke et al disclose that traditionally, HF vapor etching is performed with a mixture of HF and H<sub>2</sub>O vapors at near atmospheric pressures in a mode where the process gases are continuous flowing, the so-called dynamic mode, but because of controllability problems with this process, it has been improved by performing it at substantially reduced pressures, and applying a different procedure, the so-called static mode; despite these improvements, the controllability of the process is still problematic (column 2, lines 1-11). The invention of Verhaverbeke et al is an improvement over this prior art, and involves the use of gaseous mixtures of hydrogen fluoride and one or more carboxylic acids, and which can be performed in the static mode or the dynamic mode.

It is not clear why one skilled in the art would combine Mehta and Verhaverbeke et al. Mehta is concerned with selectively removing a porous silicon oxide layer from a substrate having a portion thereon with an exposed dense silicon oxide to be retained on the substrate, and involves the use of anhydrous hydrogen fluoride. Verhaverbeke et al, on the other hand, is not concerned with **selective** removal of one out of two silicon oxide layers, and is not concerned with **anhydrous** hydrogen fluoride. In addition, Verhaverbeke et al do not disclose any advantage from using a dynamic mode in place of a static mode. Indeed, in the disclosure of Verhaverbeke et al relied on by the Examiner, i.e., column 2, lines 1-15, the static mode was intended to be an improvement over the dynamic mode. If anything, this disclosure teaches away from replacing the pulse treatment of Mehta with a continuous


treatment. Moreover, if a proposed modification would render a prior art invention unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984) (copy enclosed). See also MPEP 2143.01. Indeed, Verhaverbeke et al is essentially irrelevant with regard to selective etching processes using anhydrous hydrogen fluoride gas.

For all the above reasons, it is respectfully requested that the rejection be withdrawn.

All of the presently-pending claims in this application are believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

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